Polarized Proton Run

February 19, 2008

Tuesday, February 12

- Ramp tuning towards 109x109, 1.0e11.
- Blue quench during tune swing, with 65 bunches. NO loss monitors pulled the permit – ev-blm2 had been disabled since February 6!
- A successful 65x65 ramp seemingly showed that problem is due to long-range beam-beam interactions.
- Worked on cogging on the ramp; still not perfect.
- "Overnight store" with 109x109, 0.9e11, 3.5 kHz rates.

- Polarimeter found unable to measure with 109 bunches.
- Dump; filled 56x56, 0.8–0.9e11.
- Overnight store, 2.5 kHz ZDC rates.
- Source turned off for maintenance.

Wednesday, February 13

- 4 hour Maintenance Period.
- 8 hours of ramp development to improve intensity/luminosity with 109 bunches.
- 109 bunch ramp, 0.7e11, for overnight collisions.
- Polarimeter setup for 109 bunches using overnight store.

Thursday, February 14

APEX:

- revisited near-integer working point
- β^*-squeeze to 0.6 m
- Revisited cogging on the ramp (=longitudinal separation) to overcome "long-range beam-beam problem."
- First test ramp after APEX failed due to leftover chromaticity settings in Blue RTDL frames.
- Overnight store, 0.8e11 in 109 bunches. 2.7kHz at PHENIX.

Friday, February 15

- PHENIX agreed to forego the rotator ramp. We will subsequently squeeze β^* as low as possible (minimum 60 cm). At each intermediate step we will provide a couple of stores to assess the lifetime and background situation. Once we have settled on the final value for β^*, we may develop a rotator ramp for that configuration, if desired by PHENIX.

- Rebooting the RampManager inadvertently made pp83 the live ramp. This was noticed on the ramp; decided to stay with it - though we had planned to make this change on Saturday.

- Provided two stores with pp83 overnight, 65x65.

- First store: 0.9e11 in Blue, 0.85e11 in Yellow. 2.7 kHz at PHENIX (same as with 0.8e11 in 109 bunches the night before). Witness bunches have lower rates.

- Second store: 0.87e11 in Blue, 0.94e11 in Yellow. 2.8 kHz at PHENIX.

Saturday, February 16

- Perceived "long-range beam-beam interaction" was actually caused by poor injection kicker timing. In a 120 bunch pattern, injecting a bunch affected the stored bunch just ahead of it.

- Moved Blue store working point across the diagonal, mirroring Yellow tunes.

- Test ramp (9886) with 65 bunches, 0.8e11 had 3.6kHz - could have been 4 kHz if steering had been better/faster. Calculated emittance is 20π (PHENIX).

- Second store (9888) provided 3.5 kHz, with 65x65, 1.0e11. Seems less than the test ramp - why? Some tuning for next store.

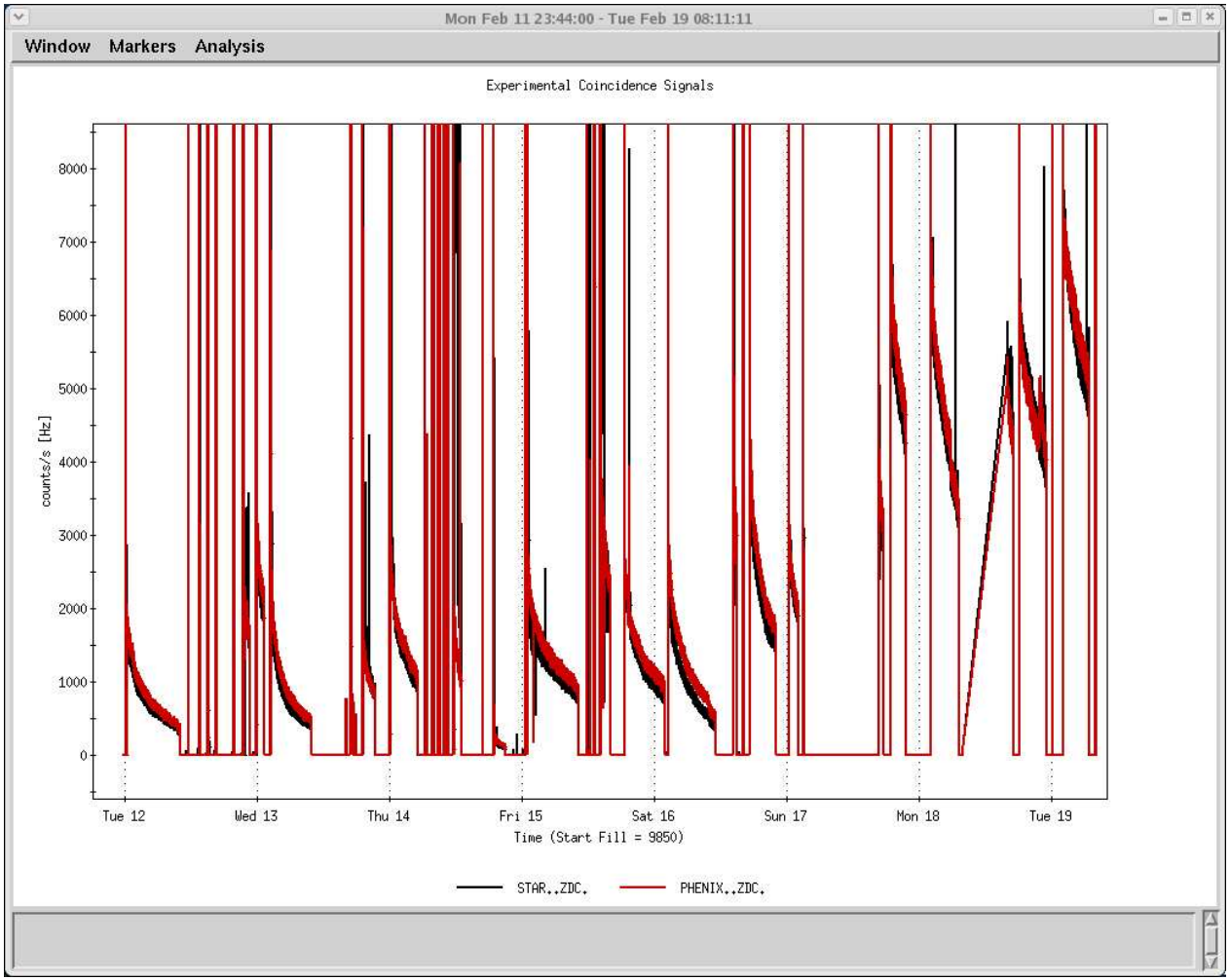
- Store 9890, with 0.95e11, 65x65 gives 3.5 kHz. Lost due to rotator QLI (at 1 amp).

- Store 9891 lost due to PASS problem in IR 4 at 3:11 (after 15 minutes at store).

Sunday, February 17

- 12 hours downtime due to PASS problem in IR 4.
- Test ramp 9896 with 0.85x0.83e11. Yellow vertical emittance blows up at store.
- Changed the order of events at store:
  First cogging, then separation bump removal (by Tape).
- Fill 9897: 1.03x1.01e11, 109 bunches, 7 kHz at PHENIX. 22π initial emittances. Had to cog manually - resulted in timing shift at experiments.
- Fill 9898: 1.04x1.00e11, 109 bunches, 7 kHz at PHENIX. 24π initial emittance.

ZDC rates


Mon Feb 11 23:44:00 - Tue Feb 19 08:11:11
Window
Markers
Analysis
Experimental Coincidence Signals
counts/s [Hz]
8000
7000
6000
5000
4000
3000
2000
1000
0
Tue 12
Wed 13
Thu 14
Fri 15
Sat 16
Sun 17
Mon 18
Tue 19
Time (Start Fill = 9850)
STAR.,ZDC.
PHENIX.,ZDC.

Monday, February 18

- Still trying to understand possible Yellow depolarization on the ramp.

- Store polarization (online) is 60 percent in Blue, 50 percent in Yellow. Offline results in Blue are 3 – 5 percent lower.

- Provided two stores overnight.

- Fill 9902 with 1.11/1.07e11 had 6.3 kHz initially, 4 kHz after 5 hours. Initial emittances are 32π. Zero field run for PHENIX towards end of store.

- Fill 9903 with 1.27/1.22e11 (!!!) lost at snapback. Yellow Landau tripped during "Up" sequence. Network switch down, preventing communication with most FECs.

- "Fill" 9904 used for hysteresis ramp?

- Fill 9905 with 1.15/1.13e11 had 7.7 kHz initially, 5 kHz after 4.5 hours. Initial emittances are 27π.

Plan for the week

- Continue providing Physics stores.
- Fine-tune the ramp, slowly increase intensities.
- Begin β^*-squeeze (to be discussed at Machine/Detector Meeting).